

Toddlers learn from math books, games

Arvind Gupta answers your math questions

BY ARVIND GUPTA, SPECIAL TO THE SUN APRIL 1, 2009

Tammy Williams

Hi, Last week's article mentioned websites and ideas for introducing math at age five. Do you have suggestions for introducing math to children as young as two? We are teaching our two-year-old son math by counting; introducing two numbers every two weeks, both written and numerical, in puzzles and game formats and would really appreciate any other suggestions for teaching math at his age.

Hi Tammy,

You may have read them already, but if you haven't, look at the Math Matters article from March 25 entitled "Math and Toddlers", plus the tips "Fun ways to help your toddler learn math". This includes fun and simple games and activities to do with your child to excite your son's naturally-developing mathematical mind. Please take a look at the suggested online math resources for kids for parent resources, recommended books, and online games that you can try together with your son as he nears the age of three.

A great place to look for guidelines about what your child should know and when, is the "Ages and Stages" link on the Invest in Kids website (www.investinkids.ca). Here you will find age-appropriate activities for play to encourage your child to move along where he's at without boring or frustrating him with tasks that are too easy or too hard.

Certainly, you can expose your son to the written symbols that represent the concept of the number two (2), for example.

Keep in mind, though, that research shows that children of your son's age who are developing their language skills and trying to match up new mathematical language with their pre-existing understanding, will make mistakes and confuse the words even though a concept is clear to them outside of spoken or written language. So don't worry if you show your son three blocks and he says or points to the number four -- these language and reading skills will develop later. Instead, you could have him place those three blocks inside three cups so he can further explore one-to-one correspondence. Eventually, he will also be able to choose a drawing of three dots to match those three blocks.

Louis

What about probability? I'm told that humans aren't born with this capability, unlike counting, so that's why we don't handle uncertainty well in our decision-making without formal training?

Hi Louis,

A very interesting question, Louis. We don't appear to be born with an ability to handle probability. Even the idea that there 'is' such a thing as chance seems to be learned only from real-life experience. And even after a lifetime's experience, it still remains rather mysterious. The mystery is not in the mathematics: the mathematical theory of probability is quite well-understood. The mystery is why the mathematics describes the real world so well.

Behavioural psychologists Daniel Kahneman and Amos Tversky in their book *Judgement Under Uncertainty: Heuristics and Biases* studied how people handle chance. They performed a number of clever experiments to show that people badly misestimate probabilities and, in fact, do not do well at applying logic to them.

In one experiment, they described a woman named Linda. Then, they asked the subjects to order the probabilities of the truth of several statements about her. Three of the choices were (a) Linda is active

in the feminist movement, (b) Linda is a bank teller and (c) Linda is a bank teller who is active in the feminist movement. Approximately 85% of participants thought that (a) was most probable which was reasonable from the description which they were given and in addition thought that that (c) was more probable than (b), in spite of the fact that, logically, it couldn't be as it described a strictly smaller class of people than (b). Interestingly enough, this was independent of the amount of training they had had in probability or statistics. Try it yourself -- even when you know (b) has to be more likely, it's hard not to pick (c).

More recently, author Nassim Nicholas Taleb, in his book, *The Black Swan: The Impact of the Highly Improbable* claimed that even very experienced, intelligent people are particularly bad at estimating the probability of rare occurrences - and that people can make a lot of money from this fact. I hope this provides some food for thought.

Jennifer Sherlock

I am a Grade 4/5 teacher and read your article this morning. I was interested in purchasing two of the books that you mentioned *Memorize in Minutes: the Times Tables and/or Multiplication in a Flash...* however, when I phoned ARTEL and then 32 Books in North Vancouver I had no success. The first book is out of print and they could not find the other without a publisher or more info. Can you suggest where I might find these?

Hello Jennifer,

I found a link to Krimsten Publishing from the Multiplication.com website when I Googled the title *Memorize in Minutes*. I can't speak for the reliability of the publishing company, but they have both books on sale as a package. Good luck!

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